

Amendments to the Claims:

This listing of the claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1 (Currently Amended): A magnetic recording medium including ~~at least one~~ Cu-containing magnetic recording ~~layer~~ layers (CuML) comprised of a ~~Cu-containing stacked bi-layer structure~~ [Cr-rich CuML/Cr-poor CuML]_n, where $n = 1$ to 10 and said [Cr-rich CuML/Cr-poor CuML] bi-layer is comprised of a Cr-rich, Cu-containing magnetic recording layer (Cr-rich CuML) that includes a Cr-rich magnetic alloy material selected from the group consisting of:

(a) a CoCrPtBCu alloy having a composition represented by the formula $\text{Co}_{100-x-y-z-\alpha}\text{Cr}_x\text{Pt}_y\text{B}_z\text{Cu}_\alpha$, wherein $[[0]]$ $16 \leq x \leq 20$, $0 < y \leq 30$, $0 < z \leq 24$, and $0 < \alpha \leq 10$;

(b) a CoCrPtBCu alloy having a composition represented by the formula $\text{Co}_{100-x-y-z-\alpha}\text{Cr}_x\text{Pt}_y\text{B}_z\text{Cu}_\alpha$, wherein $[[0 <]]$ $16 \leq x \leq 30$, $0 < y \leq 30$, $7 < z \leq 24$, and $0 < \alpha \leq 10$; and

(c) a CoCrTaCu alloy having a composition represented by the formula $\text{Co}_{100-x-y-\alpha}\text{Cr}_x\text{Ta}_y\text{Cu}_\alpha$, ~~containing less than 30 at. % Cr~~ wherein $16 \leq x < 30$, containing up to 8 at. % Ta, and up to 10 at. % Cu; and

a Cr-poor, Cu-containing magnetic recording layer (Cr-poor CuML) that includes a Cr-poor magnetic alloy material selected from the group consisting of:

(d) a CoCrPtBCu alloy having a composition represented by the formula $\text{Co}_{100-x-y-z-\alpha}\text{Cr}_x\text{Pt}_y\text{B}_z\text{Cu}_\alpha$, wherein $0 < x < 16$, $0 < y \leq 30$, $0 < z \leq 24$, and $0 < \alpha \leq 10$;

(e) a CoCrPtBCu alloy having a composition represented by the formula $\text{Co}_{100-x-y-z-\alpha}\text{Cr}_x\text{Pt}_y\text{B}_z\text{Cu}_\alpha$, wherein $0 < x < 16$, $0 < y \leq 30$, $7 < z \leq 24$, and $0 < \alpha \leq 10$; and

(f) a CoCrTaCu alloy having a composition represented by the formula $\text{Co}_{100-x-y-z}\text{Cr}_x\text{Ta}_y\text{Cu}_z$, wherein $0 < x < 16$, containing up to 8 at. % Ta, and up to 10 at. % Cu.

2 (Currently Amended): The medium as in claim 1, wherein:

said Cr-rich CuML and Cr-poor CuML layers are selected from the group consisting of (a) and (b), and (d) and (e), respectively, and

said Cu-containing magnetic alloy materials (a), ~~and (b), (d), and (e)~~ further include at least one element selected from the group consisting of: Si, Ti, V, Fe, Ni, Ge, Zr, Nb, Mo, Ru, Ag, Hf, Ta, W, and Au.

3 (Canceled)

4 (Canceled)

5 (Currently Amended): The medium as in claim 1, wherein:

said Cr-rich CuML and Cr-poor CuML layers are selected from the group consisting of (c) and (f), respectively, and

said Cu-containing magnetic alloy material (c) and (f) ~~further includes~~ include at least one element selected from the group consisting of: B, Si, Ti, V, Fe, Ni, Ge, Zr, Nb, Mo, Ru, Ag, Hf, Pt, W, and Au.

6 (Canceled)

7 (Canceled)

8 (Currently Amended): The medium as in claim 1, further including at least one additional Cu-containing magnetic recording layer (CuML) comprised of a Cu-containing magnetic alloy material having a composition represented by the formula $\text{Co}_{100-x-y-z}\text{Cr}_x\text{Pt}_y\text{B}_z\text{Cu}_z$, wherein $0 < x \leq 30$, $0 < y \leq 30$, $0 < z \leq 24$, $0 < \alpha \leq 10$, and $x + z \leq 35$.

9 (Original): The medium as in claim 1, further including at least one Cu-free magnetic recording layer (ML).

10 (Original): The medium as in claim 9, wherein said at least one Cu-free magnetic recording layer (ML) comprises a magnetic alloy material selected from among CoCr and CoCr containing at least one element selected from the group consisting of B, Si, Ti, V, Fe, Ni, Ge, Zr, Nb, Mo, Ru, Ag, Hf, W, Pt, and Au.

11 (Canceled)

12 (Currently Amended): ~~The medium as in claim 9, comprising:~~ A magnetic recording medium including Cu-containing magnetic recording layers (CuML) and at least one Cu-free magnetic recording (ML) comprised of a stacked tri-layer structure [ML/Cr-rich CuML/Cr-poor CuML]_n, where $n = 1$ to 10 and each [ML/Cr-rich CuML/Cr-poor CuML] tri-layer is comprised, in overlying sequence, of a Cu-free magnetic recording layer (ML)[[.]]; a Cr-rich, Cu-containing magnetic recording layer (Cr-rich CuML) of a Cr-rich magnetic alloy material (a), (b), or (c), comprised of a Cu-containing magnetic alloy material selected from the group consisting of:

a CoCrPtBCu alloy having a composition represented by the formula $\text{Co}_{100-x-y-z-\alpha}\text{Cr}_x\text{Pt}_y\text{B}_z\text{Cu}_\alpha$

wherein $16 \leq x \leq 20$, $0 < y \leq 30$, $0 < z \leq 24$, and $0 < \alpha \leq 10$;

a CoCrPtBCu alloy having a composition represented by the formula $\text{Co}_{100-x-y-z-\alpha}\text{Cr}_x\text{Pt}_y\text{B}_z\text{Cu}_\alpha$

wherein $16 \leq x \leq 30$, $0 < y \leq 30$, $7 < z \leq 24$, and $0 < \alpha \leq 10$; and

a CoCrTaCu alloy having a composition represented by the formula $\text{Co}_{100-x-y-\alpha}\text{Cr}_x\text{Ta}_y\text{Cu}_\alpha$

wherein $16 \leq x \leq 30$, containing up to 8 at. % Ta, and up to 10 at. % Cu; and

an overlying a Cr-poor, Cu-containing magnetic recording layer (Cr-poor CuML) of a Cr-poor magnetic alloy material (a), (b), or (c) comprised of a Cu-containing magnetic alloy material selected from the group consisting of:

a CoCrPtBCu alloy having a composition represented by the formula $\text{Co}_{100-x-y-z-\alpha}\text{Cr}_x\text{Pt}_y\text{B}_z\text{Cu}_\alpha$

wherein $0 < x < 16$, $0 < y \leq 30$, $0 < z \leq 24$, and $0 < \alpha \leq 10$;

a CoCrPtBCu alloy having a composition represented by the formula $\text{Co}_{100-x-y-z}$

$\alpha\text{Cr}_x\text{Pt}_y\text{B}_z\text{Cu}_\alpha$, wherein $0 < x < 16$, $0 < y \leq 30$, $7 < z \leq 24$, and $0 < \alpha \leq 10$; and

(c) a CoCrTaCu alloy having a composition represented by the formula $\text{Co}_{100-x-y}$

$\alpha\text{Cr}_x\text{Ta}_y\text{Cu}_\alpha$, wherein $0 < x < 16$, containing up to 8 at. % Ta, and up to 10 at. % Cu.

13 (Canceled)

14 (Canceled)

15 (Canceled)

16 (Currently Amended): The medium as in claim 1, in the form of an anti-ferromagnetically coupled (AFC) medium, comprising:

a bottom magnetic layer spaced apart from a top magnetic recording layer by a non-magnetic spacer layer, ~~said top magnetic recording layer including a Cu-containing magnetic recording layer (CuML) comprised of a said Cu-containing magnetic alloy material (a), (b), or~~ (e).

17 (Original): The medium as in claim 16, wherein:

said spacer layer comprises a non-magnetic material selected from the group consisting of: Ru, Rh, Ir, Cr, Cu, Re, V, and their alloys.

18 (Original): The medium as in claim 16, wherein:

said top magnetic recording layer further includes at least one Cu-free magnetic recording layer (ML).

19 (Original): The medium as in claim 16, further comprising:

a top interface layer between said top magnetic recording layer and said spacer layer for improving RKKY coupling of said top and bottom magnetic layers.

20 (Original): The medium as in claim 1, comprising:

a non-magnetic substrate and non-magnetic seed and underlayers.

21 (Currently Amended): The medium as in claim 20, further comprising:

at least one non-magnetic interlayer between the Cr-rich CuML and the Cr-poor CuML
layers.